INCH-POUND

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SUPERSEDING
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FEDERAL SPECIFICATION

PADLOCK, CHANGEABLE COMBINATION (RESISTANT TO OPENING BY MANIPULATION AND SURREPTITIOUS ATTACK)

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers changeable combination padlocks designed to conform to the standards for security equipment as set forth in the "National Security Council Directive Governing the Classification, Downgrading, Declassification and Safeguarding of National Security Information." The padlocks are required to resist opening by manipulation and surreptitious techniques for the period of time specified. The padlocks are intended for use as indicated in 6.1. The padlocks are not tested for forced opening.

1.2 Classification. The padlocks shall be of the type and classes specified (see 6.2).

1.2.1 Type.

Type DE - Combination dial design (exposed shackle)

1.2.2 Classes.

Class 1 - Thirty minutes resistance to opening by radiographic techniques
Class 2 - No requirement for protection against radiographic techniques

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5340

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Federal Specifications

UU-P-553 - Paper, Wrapping, Tissue
PPP-B-566 - Boxes, Folding, Paperboard
PPP-B-585 - Boxes, Wood, Wirebound
PPP-B-591 - Boxes, Fiberboard, Wood-Cleated
PPP-B-601 - Boxes, Wood, Cleated-Plywood
PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner
PPP-B-636 - Boxes, Shipping, Fiberboard
PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall
PPP-B-665 - Boxes, Paperboard, Metal Edged and Components
PPP-B-676 - Boxes, Setup

Federal Standards

FED-STD-123 - Marking for Shipment (Civil Agencies)
FED-STD-376 - Preferred Metric Units for General Use by the Federal Government

Military Specification

MIL-L-10547 - Liners, Case, and Sheet, Overwrap; Water- Vaporproof or Waterproof, Flexible

Military Standards

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

ASTM

ASTM B86 - Standard Specification For Zinc-Alloy Die Castings
ASTM D3951 - Standard Practice for Commercial Packaging
ASTM F883 - Standard Performance Specification for Padlocks

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Padlock samples.

3.1.1 Bid samples. Unless otherwise specified (see 6.2), each bidder shall furnish, with the bid, 10 sample units they propose to furnish under the contract for inspection as specified (see 4.3.1.1). One unit of the selected product shall be kept by the testing agency and one returned to the selected bidder to be used as a guide in manufacturing the first article and production quantity (see 3.1.2). Deviation is not acceptable without formal written approval from the contracting officer. The term "unit" shall hereinafter mean a completely assembled padlock with associated tools, parts, and instructions.

3.1.2 First article. Unless otherwise specified (see 6.2), seven units shall be furnished for first article test and approval (see 4.4.1, 4.4.3, and 6.3). If the requirement for bid samples is waived, 10 padlocks (units) shall be furnished for the first article test and approval. If a product meets requirements, one unit of the selected product shall be kept by the testing agency and one returned to the selected bidder to be used as a production sample. Deviation is not acceptable without formal written approval from the contracting officer.

3.2 Description. The padlock consists of a case or body, shackle, pin, or bolt, a dial, locking parts, means for combination changing and combination scrambling when locked. The padlock is not required to resist forced entry with tools but shall be so designed and constructed to resist the effects of normal everyday use and abuse. The padlock is intended for use indoors but must resist high temperatures (+150 degrees Fahrenheit (^{o}F)), low temperatures (-40^{o}F), and high humidity (80 percent relative humidity), from shipboard use in ocean marine environment.

3.3 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specified.

3.3.1 Material of components. Unless otherwise specified, the padlock case, cover, and internal parts subject to wear, with the exception of the locking bolt and combination wheels, shall be of steel, brass, bronze, zinc alloy, or other suitable material provided the finished product withstands the tests in section 4. Combination wheels may be of any suitable material provided the finished product withstands the tests which are applicable to the class. Shackles shall be of case hardened steel or stainless steel, except that padlocks for shipboard use, when specified, shall have shackles of brass or bronze (see 6.2). Zinc alloy for parts shall conform to ASTM B86. All materials shall resist the effects of ambient heat such as an oven or similar means to a maximum temperature of 300°F for a duration of 5 minutes, minimum. The performance specified throughout section 3 of this specification shall not be impaired or modified by the heat.

3.4 Design. The design of the padlock mechanism shall preclude the changing of the combination without knowledge of the existing combination settings. Placing the shackle in the locked position shall disperse or scramble the combination to an undeterminable position. The lock mechanism shall not permit the shackle to be locked out in the open position. The locking bolt shall be guarded by not less than three combination wheels and a driving wheel or cam. It shall not be possible to determine the combination when the padlock is in the open position without knowledge of the existing combination. The shackle shall not spring out to the open position when the padlock is unlocked, but shall be required to be pulled to the open position. The term "shackle" as used herein includes a "U" shaped shackle that passes through the locking hole of the mating halves of hasps or hasp staple. The shape of the padlock shall be at the option of the contractor, provided the assembled padlock conforms to all requirements specified herein.

3.4.1 Available combinations. The combination wheels for the padlocks shall be capable of affording at least 30,000 different, independent, usable combinations. The dialing tolerance for opening the lock shall be not more than 1/4-dial division, or number, from either side of any true dialing setting.

3.4.2 Measurement systems. Unless otherwise specified, either the U.S. Customary System of Units (US) or the International System of Units (SI) shall be used in the design and construction of the padlock. When only one system of measurement is acceptable, the particular system required shall be as specified (see 6.2). When metric (SI) is used, FED-STD-376 shall be used as the guide. In this specification, all measurements, dimensions, sizes and capacities are given in US units. A conversion chart from US units to metric (SI) is provided (see 6.5)

3.5 Construction. The padlock shall be positive in its movements and functions, and the arrangement and fit of parts shall be such that it shall not be possible to insert a probing or shimming device into any opening in the case that would result in opening the padlock. The padlock shall be finished and assembled in such a manner that when in the locked condition, any penetration or spreading attempt, or the prying out or removal of component parts, including the combination dial, pushbuttons, or the back cover or any part of the lock's case shall permanently distort and visibly mark the padlock and prevent the reattachment of the components. It shall not be possible to release the shackle by tension applied between the padlock shackle and case, without completely impairing the lock to an inoperable condition. The padlock shall be designed

and constructed so that it cannot be opened by manipulation or surreptitious attack for a period specified in 3.8.

3.6 Dimensions. The outside dimensions across the shackle shall be of 1.5 inches ±0.125 inch and the space under the shackle shall be of sufficient size to fasten around a 0.75 inch diameter bar. The diameter of the shackle shall be 0.31 inch -0.00, +0.02 inch. The length of the padlock, when locked, shall be 4.375 inches maximum. The width or thickness shall not exceed 2.75 inches.

3.7 Dial face markings. The dial face shall have not less than 50 depressed graduation marks. The marks and identifying numbers shall be made clearly visible and legible for running the combination setting.

3.8 Tamper resistance. Class 1 and 2 padlocks shall resist opening for not less than 30 man-minutes by manipulation and 10 man-minutes by surreptitious attack.

3.9 Resistance to radiographic techniques. The class 1 padlock shall provide resistance to radiographic techniques for not less than 30 minutes.

3.9.1 Radiographic protection. Radiographic protection for the class 1 padlock may be provided by the composition of the materials from which its components are constructed, or may be provided by the addition of a shielding cover.

3.10 Combination change device. A key or other suitable device for changing the combination shall be furnished with each padlock. The change device, if a key, shall be combinated to the series of padlocks the producer shall furnish and shall be prominently and permanently marked with a designation of the manufacturer's padlock series. The change device shall be of corrosion-resistant material or have a corrosion-resistant finish.

3.11 Lubrication. All moving parts of the padlock mechanism shall operate smoothly and quietly. A lubricant normally employed by the manufacturer for padlocks may be used. The bearing surface of the mechanism shall not show gummy deposits or wear sufficient to interfere with its operation after 5,000 cycles (minimum) of actual or simulated locking and unlocking and 50 (minimum) actual or simulated changes of the combination.

3.12 Finish. All parts of the padlock, other then those of noncorrosive materials, shall be protected against corrosion by electroplating or other effective methods. The shackle, if of steel, shall have an electroplated nickel finish.

3.13 Marking and serialization.

3.13.1 Back. The padlock shall be legibly marked on the back with the letters "U.S.", the manufacturer's name or Commercial and Government Entity (CAGE) code, the model number, and the classification, as follows:

For class 1 padlocks:	For class 2 padlocks:
CL 1	CL 2
FF-P-110	FF-P-110
Date: (year)	Date: (year)

3.13.1.1 Method of marking. Markings specified in 3.13.1 shall be either embossed to a height of approximately 0.018 inch or engraved to a depth of not less than 0.005 inch.

3.13.2 Shackle marking. Each padlock shackle shall be identifiable by serialization of the lock shackle and the lock case cover as specified.

3.13.2.1 Shackle serial number. The series number identifying the shackle shall be randomly different from and have no association to the lock case cover series number. The number shall be stamped on so that it is concealed when the shackle is in the locked position. The series number shall be stamped on the shackle with a die in the range of 0.09375 through 0.130 inch prior to the case hardening process.

3.13.2.2 Case cover serial number. The series number identifying the case cover shall be randomly different from and have no association to the lock shackle number. The number shall appear on one side of the case cover and shall be stamped on with a die in the range of 0.09375 through 0.130 inch prior to the finish process.

3.14 Workmanship. The finished padlock shall be of substantial construction designed to withstand severe usage. Working parts shall be accurately fitted. No part shall be broken, split, fractured, or cracked. All parts shall be well finished, free from burrs, splinters, or rough edges, true to form, and free from any defect which may affect appearance, operation, or serviceability of the padlock, and shall operate as intended.

3.15 Instructions. Manufacturer's instructions normally furnished in commercial practice, describing how to run the combination and how to change the combination shall be furnished with each padlock.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspection. The inspection requirements specified herein are classified as follows:

a. Bid sample inspection (see 4.3 through 4.3.2)
b. First article inspection (see 4.4 through 4.4.3)
c. Quality conformance inspection (see 4.5 through 4.5.3)
d. Inspection of packaging (see 4.7)

4.3 Bid sample inspection. Bid sample inspections shall be conducted by agencies as specified in the contract. Samples selection at the manufacturer's option from preproduction or standard production units from the manufacturer's current inventory.

4.3.1 Bid sample examination. Bid sample padlocks shall be examined for defects listed in table I. The presence of any critical defects, one major defect, or more than 2 minor defects among all the bid sample units shall constitute failure.

TABLE I. Classification of defects.

Classification	Defects	Requirement paragraph
Critical:		
01	Combination setting can be changed without knowledge of existing combination.	3.4
02	Does not disperse or scramble combination setting as specified.	3.4
03	Shackle can be locked out in open position.	3.4
04	Dialing tolerance not as specified. Less than 30,000 different independent combinations.	3.4.1
Major:		
101	Material not as specified.	3.3.1
102	Clearance permits insertion of probes.	3.5
103	Dial markings not as specified.	3.7
104	Combination change device not corrosion-resistant as specified.	3.10
105	Combination change device not marked as specified.	3.10
106	Broken, split, fractured, or cracked part.	3.14
107	Functioning component is inoperative or will not operate as intended.	3.14

TABLE I. Classification of defects - Continued.

Classification	Defects	Requirement paragraph
Minor:		
201	Lubrication not as specified.	3.11
202	Finish not as specified.	3.12
203	Marking on back not as specified.	3.13.1
204	Marking incomplete or incorrect.	3.13.1
205	Marking method not as specified.	3.13.1.1
206	Shackle and case not serialized as specified.	3.13.2.1 and 3.13.2.2
207	Parts or components not free from burrs, splinters, or rough edges.	3.14
208	Combination setting or operation instructions missing or incomplete.	3.15

4.3.1.1 Delivery. As specified (see 3.1.1 and 6.2), bid samples shall be delivered to the test facility, transportation prepaid, furnished at no cost to the Government. Samples shall be plainly identified by securely attached durable tags, marked as follows:

Bid Sample for Test
Padlock, changeable combination
(Class Type)
Fed. Spec. FF-P-110H
Date of manufacture: (mm/yy)

4.3.2 Bid sample tests. Bid sample padlocks shall be tested in accordance with 4.6.2.2, table II, column 1. Bid sample padlocks, after testing, shall not be returned to the bidder or offeror except for one each of the padlocks selected as a production guide.

a. A test may be discontinued at the testing facility at any time the product fails to meet any one or more of the requirements of this specification. The manufacturer may be permitted to make modifications on his product during the testing phase when such modifications, in the judgment of the contracting officer and the testing facility, are clearly in the best interest of the Government.

b. In case of failure of the sample submitted, consideration will be given to the request of the manufacturer for resubmission for retest only after it has been clearly shown that changes have been made in the padlock which the Government considers sufficient to warrant retest.

c. The manufacturer or his representative will not be permitted to observe the actual test conducted on his product at the testing facility. However, when samples tested fail to comply with the requirements of this specification, the samples may be examined by the manufacturer or his representative and full details of the failure may be made known to them in a manner which, for reasons of security, will be in the best interest of the Government.

WARNING - SOME TESTS ARE HAZARDOUS:

THE UNITED STATES GOVERNMENT NEITHER ASSUMES OR ACCEPTS RESPONSIBILITY FOR ANY INJURY OR DAMAGE TO NON-GOVERNMENT PERSONNEL OR PROPERTY THAT MAY OCCUR DURING OR AS A RESULT OF ANY TEST REQUIRED BY THIS SPECIFICATION.

TABLE II. Test schedule.

Quality Assurance 1	Test 2	Test Paragraph 3	Requirement Paragraph 4
X	Manipulation resistance	4.6.3.1	3.5, 3.8
X	Surreptitious resistance	4.6.3.2	3.5, 3.8
X	Radiographic opening resistance	4.6.3.3	3.9, 3.9.1
X	Direct tension resistance	4.6.3.4	3.5, 3.8
X	Jar with tension resistance	4.6.3.5	3.5, 3.8
X	Jar without tension resistance	4.6.3.6	3.5, 3.8
X	Shackle and lock strength	4.6.3.7	3.5
X	Drop resistance	4.6.3.8	3.5, 3.8
X	High temperature operations	4.6.3.9	3.2
X	Low temperature operations	4.6.3.10	3.2
X	High humidity	4.6.3.11	3.2, 3.12
X	Heat resistance	4.6.3.12	3.3.1
X	Cycle test for wear and lubricant	4.6.3.13	3.4.1, 3.11

4.4 First article inspection.

4.4.1 Sampling for first article. When a first article is required (see 3.1.2), seven sample units shall be provided for inspection. When the requirement for bid samples is waived ten units shall be provided for inspection. The first article units shall be production units manufactured using the selected bid sample guide as a production sample or standard production units from the manufacturers current inventory (see 6.3).

4.4.2 First article examination. The first article shall be examined as specified in 4.6.1. Presence of one or more critical defects shall be cause for rejection (see 3.1.2).

4.4.3 First article tests. The first article shall be subject to the tests specified in 4.6.2.2, table II, column 2. Failure of any test shall be cause for rejection (see 3.1.2).

4.5 Quality conformance inspection.

4.5.1 Sampling.

4.5.1.1 For examination. Sampling for examination shall be in accordance with MIL-STD-105, single normal inspection level S-3. The lot shall be units produced at the same plant, by the same process with same materials, and of the same design, all offered for delivery at one time, not to exceed 5,000 units per lot.

4.5.1.2 For tests. Padlocks shall be randomly selected from the lot submitted for acceptance in accordance with MIL-STD-105, single normal inspection level S-3. Failure of any test shall be cause for rejection.

4.5.2 Examination. Samples selected in accordance with 4.5.1.1 shall be examined for defects as specified in 4.6.1. Presence of any critical defect shall be cause for rejection.

4.5.3 Tests. The padlocks selected in accordance with 4.5.1.2 shall be subjected to the tests specified in 4.6.2.2, table II, column 3. Tests shall be performed in the order shown.

4.6 Inspection procedure. Prior to examination and tests, padlocks shall be lubricated and, unless otherwise specified herein, all tests shall be conducted at the ambient air temperature at the test site.

4.6.1 Classification of defects. The padlocks with change keys, selected as specified, shall be examined for the following defects:

4.6.2 Tests.

4.6.2.1 Test conditions. Except as otherwise specified herein, tests shall be conducted at prevailing temperatures and humidity in the test facility. Prior to examination and tests, padlocks shall be lubricated unless otherwise specified herein.

4.6.2.2 Test schedule. The test schedule shall be as shown in table II, in the order shown.

4.6.3 Test procedures. For the purpose of the tests in 4.6.3.1, 4.6.3.2, and 4.6.3.6, the padlock shackle shall be fastened to a hasp secured to the top-front of a 4- or 5-drawer steel filing cabinet.

4.6.3.1 Manipulation technique test. There shall be no limit on the number of manipulation techniques attempted and each technique may be applied for the full net working time, using the human senses amplified as necessary to unlimited types of mechanical, electric, electronic, and magnetic equipment. The tools and equipment shall be capable of being carried in a case not exceeding 1.5 cubic feet (ft^3) in volume and 9 inches in thickness and which do not exceed a total weight of 25 pounds (lb) (exclusive of weight of case). The padlock shall resist opening by manipulation techniques for the period of time specified in 3.8.

4.6.3.2 Surreptitious attack test. There shall be no limit on the number of surreptitious attacks attempted and each attack may be applied for the full specified time. The best method or combination of methods may be applied for the full net working time. The net working time will include time expended for any masking or repair of damage to the lock that may become necessary to obliterate evidence of penetration. Any repairs necessary to obliterate or mask evidence of attack shall be made without substitution of parts. There shall be no limitations on the time required for exploration and preparation for the test. The tools and devices used in the test will be limited to those powered by hand. The tools shall be capable of being carried in a case not exceeding 1.5 ft^3 in volume and 9 inches in thickness, and shall not exceed a total of 25 lb (exclusive of weight of case). Heat above 300°F, such as that from a blowtorch or an electric arc, shall not be used. The padlock shall resist opening by surreptitious attack for the period of time specified in 3.8.

4.6.3.3 Radiographic test. The class 1 padlock shall be tested under the following conditions to determine resistance to opening by radiographic techniques. Portable x-ray equipment, excluding the use of isotopes, may be used. Weight of the equipment shall not exceed 75 lb. Any radiation shielding provided for the padlock will be included in the test. The padlock shall be radiographed and resulting radiographs shall not permit opening of the padlock within the time specified in 3.9.

4.6.3.4 Direct tension test. The body of the padlock shall be held in a metal strap bearing against the outer surface of the case with a slot permitting the shackle to pass through and engage in a suitable hook or eye. A tension force of 500 lbs shall be applied slowly along the vertical centerline of the padlock so as to put a direct and equal tension in each shank of the lock shackle. The applied tension shall not damage the lock or its locking mechanism or permit opening by manipulation within the time specified in 3.8.

4.6.3.5 Jar test with tension. With a coil spring compressed between the shackle and the lock case cover to produce a force of approximately 60 lb, the padlock shall be tested as specified in 4.6.3.6. The applied force shall not release the shackle nor permit opening by manipulation within the time specified in 3.8.

4.6.3.6 Jar test without tension. The padlock shall be fastened to a filing cabinet as specified in 4.6.3. The lock case shall be held loosely with one hand and the padlock shall be struck with a substantial blow, the hold on the padlock being released immediately before the blow, so as to jar the padlock forcibly against the cabinet. This procedure shall be performed not less than six times by striking the padlock from different directions. A wood, plastic, or lead mallet weighing not more than 12 ounces shall be used to deliver the blows. Such jarring blows shall not release the shackle nor permit opening by manipulation within the time specified in 3.8.

4.6.3.7 Padlock shackle test. The padlock shall be held firmly in a vise or other suitable device and sufficient tension force shall be applied between the lock shackle and the lock case until the shackle is broken or released from its case. The damage to the lock and shackle shall be to the extent specified in 3.5.

4.6.3.8 Drop test. At least two sample padlocks shall be dropped 6 feet to a concrete floor at least ten times. The impacts shall not damage the lock or its locking mechanism nor permit opening by manipulation within the time specified in 3.8.

4.6.3.9 High temperature operation. Subject the padlock to 150°F until the temperature throughout the padlock has stabilized (5 minutes minimum). Perform all functions required of the padlock (lock, unlock) three times while retaining this temperature. The padlock shall perform normally as specified throughout section 3 of this specification while at this temperature (see 3.2).

4.6.3.10 Low temperature operation. Subject the padlock to -40°F until the temperature throughout the padlock has stabilized (5 minutes minimum). Perform all functions required of the padlock (lock, unlock) three times while retaining the -40°F temperature. The padlock shall perform normally as specified throughout section 3 of this specification while at this temperature (see 3.2).

4.6.3.11 Humidity effects test. To determine resistance of the padlock to corrosion and functional degradation due to high humidity (ocean marine environments), conduct the salt spray test of ASTM F883 for 24 hours. After the test, the padlock shall operate properly (lock and unlock). The padlock combination change capabilities shall not have been affected by the test and shall be confirmed by making three combination changes while locking and unlocking the padlock between each combination change.

4.6.3.12 Heat resistance. Suspend the padlock in an oven that is heated to 300°F. Sustain this condition for 5 minutes. Allow the unit to cool to room temperature. Operate the padlock through all functions (opening, closing, combination change). The heat shall not have modified the normal performance of the padlock (see 3.3.1).

4.6.3.13 Wear and lubricant test. Prior to testing, record the torque required to dial the combination for opening. After the torque is determined, perform the cycle test of ASTM F883 for 5000 cycles. Upon conclusion of the cycle test the lock shall open and lock properly when the correct combination is dialed and shall operate within 10 percent of torque required to turn the dial of the new lock. The dial tolerance for opening the lock shall not exceed the 1/4 dial division (see 3.4.1). Upon conclusion of the cycle test, the lock

shall open and close properly for each of 50 different combination changes when the proper combination is dialed. The dial tolerance for opening and the 10 percent torque variation specified above shall not be exceeded when opening and closing the lock for each of the 50 combination changes.

4.7 Inspection of preparation for delivery. An inspection shall be made to determine that the packaging, packing and marking comply with the requirements in section 5 of this specification. Defects shall be scored in accordance with table III. For examination of interior packaging, the sample unit shall be one shipping container fully prepared for delivery, selected at random just prior to the closing operations. Sampling shall be in accordance with MIL-STD-105. Defects of closure listed shall be examined on shipping containers fully prepared for delivery. The lot size shall be the number of shipping containers in end item inspection lot. The inspection shall be single normal level S-2.

TABLE III. Classification of preparation for delivery defects.

Examine	Defects
Markings (exterior and interior)	Omitted, incorrect, illegible, improper size, location, sequence, or method of application.
Materials	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling. Distortion of container.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C (commercial) as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Unit packaging. Each padlock with instructions shall be wrapped with material conforming to UU-P-553 and packed in a close-fitting box conforming to PPP-B-566 style II, type A, class A or PPP-B-665 style B or PPP-B-676 type I.

5.1.1.2 Intermediate packaging. Twelve unit packages of padlocks of the description shall be intermediate packaged in a close-fitting box conforming to PPP-B-566, PPP-B-665, PPP-B-676, or PPP-B-636, class domestic. The fiberboard box shall be closed in accordance with the appendix to the box specification.

5.1.2 Commercial. The padlocks shall be packaged in accordance with ASTM D3951 to afford adequate protection against damage during shipment from the supplier to the initial destination.

5.2 Packing. Packing shall be level A or commercial as specified (see 6.2).

5.2.1 Level A. The padlocks in quantities as specified (see 6.2) shall be packed in a close-fitting box conforming to either PPP-B-585 class 3, PPP-B-591 class II, PPP-B-601 overseas type, PPP-B-621 class 2, PPP-B-636 class weather-resistant or, PPP-B-640 grade A. The wood boxes shall be provided with a case liner conforming to MIL-L-10547 and sealed in accordance with the appendix thereto. The boxes shall be closed and strapped in accordance with the specification or appendix thereto. The gross weight of the triple-wall fiberboard box and the wood boxes shall not exceed 200 lb. The gross weight of the PPP-B-636 box shall not exceed the weight limitations of the box specification.

5.2.2 Commercial. The padlocks shall be packed in accordance with ASTM D3951 to assure carrier acceptance, and safe arrival at their destination.

5.3 Marking.

5.3.1 Civil agencies. In addition to markings required by the contract or order, the interior packaging and shipping containers shall be marked in accordance with FED-STD-123.

5.3.2 Military agencies. In addition to markings required by the contract or order, the interior packaging and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The padlocks under this specification are intended for use as determined for low level resistance to forced entry and high level tell-tale manipulation or surreptitious action. The padlocks are intended for use ashore and aboard ocean going vessels, indoors, or outdoors, semi-protected by a structural overhang similar to eaves or a lean-to.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Quantity, type and class padlock required (see 1.2).
c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
d. When bid samples are required (see 3.1.1).
e. When a first article is required (see 3.1.2).
f. Material required for case and shackle (see 3.3.1).
g. Measurement system required (see 3.4.2).
h. Bid sample delivery instructions (see 4.3.1.1).
i. Packaging level required (see 5.1, 5.2, and 5.2.1).

6.2.1 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 227.405-70 are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.3 First article. When a first article inspection is required, the unit shall be tested and shall be a standard production unit from the contractor's current inventory or exactly the same as the production guide, as specified in 4.4.1. The first article shall consist of seven units, or ten if bid samples are waived (see 3.1.2). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, availability of drawings of hasps required for tests, source to purchase hasps for tests, and approval of the first article. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. The contracting officer should contact the Assistant Program Manager for Physical Security Equipment, NFESC Code ESC66, Port Hueneme, California 93043-5003, or GSA Code 7FXE, as appropriate regarding testing and disposition of the test samples.

6.4 Definition of terms used in this specification:

6.4.1 Manipulation. For the purpose of this specification, the term "manipulation" means the opening of the padlock without alteration of the physical structure or disarranging or substitution of any parts of the padlock. Ordinarily manipulation would be accomplished by movement of the dial.

6.4.2 Surreptitious attack. For the purpose of this specification, the term "opening by surreptitious attack" is defined as the opening and closing of the padlock in such a manner or by such a means as to leave no evidence of the act which would be readily discernible in normal use of the padlock. Ordinarily surreptitious opening would be accomplished by drilling, or other physical or mechanical penetration or the forcing or prying out of component parts, and then restoring the lock to its apparent original condition by repairs.

6.4.3 Man-minutes. Time expended times the number of men engaged in the test.

6.4.4 Radiographic attack test. For the purpose of this specification the test specified in 4.6.3.3 is intended to simulate attempted radiographic attack on the padlock within the specification limits of time and equipment, utilizing practicable and feasible procedures and equipment available to Government testing agencies performing the test.

6.4.5 Normal use. For the purpose of this specification the term "normal use" is defined as dialing the combination and opening the padlock, withdrawing the shackle from the staple, ring, chain link, or other device, and relocking the padlock, with all exterior surfaces of the padlock exposed to both view and touch. Occasional dropping of the padlock is also expected.

6.4 Cross reference of classifications.

FF-P-110F	FF-P-110G	FF-P-110H
Type DC	Deleted	No changes
Type DE	Type DE	to types
Type PC	Deleted	and classes.
Type PE	Deleted	
Class 1	Class 1	
Class 2	Class 2	

6.5 Measurement conversion. Measurements used in this specification are converted to metric (SI) as follows:

US	Metric (SI)
150 degrees Fahrenheit (^{o}F)	66 degrees Celsius (^{o}C)
300^{o}F	149^{o}C
-40^{o}F	-40^{o}C
0.005 inch	0.127 millimeter (mm)
0.018 inch	0.4572 mm
0.02 inch	0.55 mm
0.09375 through 0.130 inch	2.381 through 3.302 mm
0.125 inch	3.175 mm
0.31 inch	7.938 mm
0.75 inch	19.05 mm
1.5 inches	38.1 mm
2.75 inches	69.85 mm
4.375 inches	111.125 mm
9 inches	228.6 mm
6 feet	1.83 meters
12 ounces	340 grams
25 lb	11.34 kilograms (kg)
60 lb	27.2 kg
500 lb	226.8 kg
1.5 ft^{3}	0.04245 cubic meters

6.6 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

MILITARY INTERESTS:

Custodians

Navy - YD1
Air Force - 99

Review activities

Army - AV, CE, GL
Navy - CG, MC, OS
Air Force - 82
DLA - IS

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS (7FXE)

PREPARING ACTIVITY:

Navy - YD1

(Project 5340-2154)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	FF-P-110H	940311

3. DOCUMENT TITLE: PADLOCK, CHANGEABLE COMBINATION (RESISTANT TO OPENING BY MANIPULATION AND SURREPTITIOUS ATTACK)

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial	(2) AUTOVON
MR. RAY K. MAYER	(805) 982-5615	551-5615
c. ADDRESS (Include Zip Code) COMMANDING OFFICER, NCBC CODE 1564C 1000 23RD AVENUE PORT HUENEME, CA 93043-4301	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	